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On the Cranial Characteristics of *GADUS PROXIMUS* Grd.

BY THEODORE GILL.

While engaged in the investigation of the comparative anatomy of the Gadoids and allied families, my attention was arrested by the very distinctive characters exhibited by the Californian Gadoid named by Girard *Gadus proximus* or *Morrhua proxima*. The title of that form to generic separation from the typical *Gadi*, is fully confirmed. I may remark, that I had long distrusted its pertinence to *Gadus* on account of its small size, but the few and trivial outward peculiarities exhibited by it, almost forbade a separation, until more should be known concerning its organization.

The affinities of the new genus are, perhaps, rather with *Brachygadus* than *Gadus* itself; but the form of the head sufficiently distinguishes it from that type. The distinctive external characters are the angular form of the fins, especially of the first dorsal, the small size and the immaculate body. All the osteological characters, herewith given, are contrasted with those of *Gadus*, and the peculiarities are indicated by the italicized portions.

If, as I suspect, the *Gadus pygmaeus* of Pallas belongs to *Boreogadus*, as restricted by myself, at least three genera of *Gadiniæ* are represented along the western American coast.

MICROGADUS Gill.

The cranium is proportionally broader towards the front and less flattened, while the brain case is flattened below, *decidedly swollen* laterally and on each side of a depressed *sphenoidal groove*, and has an ovate cordiform shape. The *paroccipital* or *epiotic* is not produced into an angle behind, but is *obtusely rounded*, and its posterior or *outwardly descending ridge blunt*. The *petrosal* or *opisthotic* is well developed, oblong, and with its re-entering angle *high up*, and, on a line with it, the surface is divided into two parts; an *upper narrow* and flattened one, and a lower expanded one, much swollen; the *alisphenoid* or *pro-otic* is *oblong*, acutely emarginated in front, swollen from the region of the high anterior sinus, and above it little produced forwards. The great *frontal* is little longer than broad, with supraoccipital crest continued only along its posterior *third*, but an anterior low crest *continued forwards* on the bone, and near the front expanded upwards, and with the *expanded portion* behind dividing into narrow *lateral wings*; the lateral tectiform ridges of the frontal are continued forwards and *curved outwards* towards the antero-lateral angles. The anterior frontals are *mostly covered in front* by the great frontal, and are much *developed* in the direction of the *antero-lateral angles*; the inferior expanded axillar portion being very narrow. The nasal has a rounded ridge in front continued well below, and its posterior crest is *laminar and trenchant*.

The rest of the bones offer less decided peculiarities, and, therefore, their immediate consideration is less requisite.

Gadus tomcodus Mitchell exhibits similar modifications of the cranium, and should be approximated to *G. proximus*.

Note on several Genera of CYPRINOIDS.

BY THEODORE GILL.

As considerable misapprehension appears to have prevailed regarding several genera of Cyprinoids, established for forms characteristic of the Pacific slope of North America by Girard, due, perhaps, to the vague or erroneous ideas entertained by that gentleman himself, it may be advisable to give the partial results of a renewed examination.

1865.]

The genera *Lavinia*, *Siboma*, *Algansea*, *Tigoma*, *Cheonda*, *Gila*, *Ptychochilus* and *Mylochilus*, are closely related to each other, and cannot be distributed among different subfamilies, as has been attempted. Indeed, some of the genera so separated are so intimately allied, that their claims to generic distinction are extremely doubtful. *Siboma* appears to be nearly allied to *Lavinia*, and includes only the *S. crassicauda*, the *S. atraria* belonging rather to *Algansea*. *Algansea* itself and *Tigoma* are scarcely distinguishable, they differing only in the pharyngeal teeth,—*Algansea* having teeth 5—5, increasing upwards, while *Tigoma* has, normally, 2 | 5—5 | 2: both groups have narrow suborbitals. *Cheonda* should be restricted to *C. Cooperi*. The difference between *C. caerulea* and species of *Tigoma* are not evident. *Gila* and *Ptychochilus* both require revision. *Mylochilus* and *Mylopharodon* do not differ generically, wherefore the former name alone can be retained. The genus *Acrochilus* of Agassiz, referred to *Lavinia* by Girard, has no affinity to that group, being nearly related to *Chondrostoma*, as shown by Agassiz, who has well described its peculiarities, while *Lavinia* as well as *Tigoma*, *Algansea*, &c., are closely related to the European *Leucisci*. As I propose, on another occasion, to give the full generic characters, as well as anatomy of the genera of Western American Cyprinoids, I defer till then further consideration of their affinities.

Observations on the EOCENE LIGNITE FORMATION of the United States.

BY T. A. CONRAD.

OLDER EOCENE OR LONDON CLAY.

Lignite Epoch.

Some years ago I visited a marl deposit near Long Branch, Monmouth Co., New Jersey, in which casts of a few shells presented an eocene character. Observing in Vanuxem's cabinet a specimen of what is now known to be *Aturia ziczac*, I described it in the Journal of the Academy of Natural Sciences, vol. i. 2d series, p. 129, and referred the marl, principally on account of the presence of this shell, to the eocene era. I also described an imperfect cast of the same species as *Nautilus angustatus*, in Dana's Report on the Geology of the Exploring Expedition, which was found at Astoria in Oregon, in company with many shells which I mistook for miocene forms; but a more extended acquaintance with eocene types shows their older tertiary relations, and their matrix to be synchronous with the London Clay of Sheppey, Highgate and Bracklesham. Professor Cook has lately sent me a box of specimens of similar age from Shark River, Monmouth Co., N. Jersey, collected by Dr. Kneiskern. In company with *Aturia ziczac* there are imperfect specimens of *Nautilus Lamarckii*, Deshayes, another older eocene form of the Paris basin and of Belgium. Fruits also occur in this bed, referrible to the genera *Nipadites* and *Mimosites*, showing the tropical or semitropical climate of the era, and giving evidence of the intimate relations of the deposit to the Brandon and Mississippi Lignite strata. Indeed, it seems clear that this Shark River marl was the bed of the oldest eocene ocean, and that the flora of the Brandon and Southern tertiary epoch flourished at the same time. The local, circumscribed character of the Brandon Lignite is attributed by Prof. Lesley to its having filled a deep depression, thus escaping the denuding forces which swept all traces of it away over a wide region that it once covered. The locality at Mont Alto, near Chambersburg, described by Prof. Lesley, is doubtless a locally preserved fragment of a vast formation once deposited over the Appalachian slope to the very base of the mountain range, and occupying a large space in South Carolina, Georgia, Alabama and Mississippi, and in fact, extending to the Pacific as far north as Vancouver's Island.

[April,